## Stepwise Derivation Practice

|  | 1 | $\mathrm{P} \supset \mathrm{Q}$ | A | (Hint, use $\sim \mathrm{I})$ |
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|  | 2 | $\sim \mathrm{Q}$ | A | Derive $\sim \mathrm{P}$ |
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|  | 1 | $R \vee^{\sim} \mathrm{Q}$ | A | (hint, use vE) |
| :--- | :--- | :--- | :--- | :--- |
|  | 2 | $\mathrm{R} \supset^{\sim} \mathrm{Q}$ | A | Derive ${ }^{\sim} \mathrm{Q}$ |
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|  | 1 | $\mathrm{P} \supset \mathrm{Q}$ | A |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 2 | $\mathrm{R} \vee^{\sim} \mathrm{Q}$ | A |  |
|  | 3 | $\mathrm{R} \supset^{\sim} \mathrm{Q}$ | A | Derive $(\sim \mathrm{P} \& \sim \mathrm{Q}) \vee \mathrm{R}$ |
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|  | 1 | $R \vee^{\sim} \mathrm{Q}$ | A |  |
| :--- | :--- | :--- | :--- | :--- |
|  | 2 | $\mathrm{R} \supset{ }^{\sim} \mathrm{Q}$ | A | Derive $(\mathrm{P} \supset \mathrm{Q}) \supset[(\sim \mathrm{P} \& \sim \mathrm{Q}) \vee \mathrm{R}]$ |
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